

ACTIVITY CARDS

The following problems are intended for classroom use as mentioned in the preceding teacher's guide. The problems may be keyed according to degree of difficulty but there are still sufficient of all kinds to provide student choice. Teacher choice is allowed for also in that each teacher may delete, add to, or modify any of the problems as appropriate for the needs of the students.

Problem 1:

A freight train left Vancouver for Calgary averaging 55 m.p.h. At the same time a passenger train left Calgary for Vancouver averaging 70 m.p.h. If they left at 9:00 a.m., what time would they pass each other? At what distance from Calgary?

Problem 2:

During its flight to Mars, Mariner 6 was at a point 104,637,260 straight-line miles from earth. The total distance between earth and Mars was calculated at 112,660,617 miles. If Mariner 6 was travelling at a velocity of 55,000 m.p.h., how long did it have to travel before reaching Mars? (Answer to nearest hour.)

Problem 3:

Smash-It-Hard and Company charge 10¢ for renting a badminton racquet, plus 2¢ per day.

a) Complete the following table

Number of Days (n)	1	2	3	4	5	7	10	n
Charge (cents) (c)	12	14	16					

b) If C cents is the charge for n days, write a condition connecting C and n.

c) Make a graph from the table and use this to find out how long you could rent a racquet with 50¢.*

Problem 4:

The tide is rising at the rate of 16 inches per hour. Four rungs of the ladder on the boat are below the water. Each rung is 1 1/2 inches thick. There are 8 inches between rungs.

HOW MANY RUNGS OF THE LADDER WILL BE SUBMERGED 5 1/2 HOURS LATER? **

*Modified after F. Lord, The Language of Mathematics (London, Ont.: John Murray Publishers Ltd., 1960).

**Modified after D.G. Seymour, and R. Gidley, EUREKA (Palo Alto, Calif.: Creative Publications, 1968), p. 120.

Problem 5:

Beginning from the smallest, write the following real numbers in order.

$$\sqrt{12} \quad 3.4\bar{6} \quad 3.47 \quad 3.465 \quad \sqrt{11} \quad 3.46\bar{3}$$

Starting with the largest, write the following real numbers in order.

$$-\sqrt{7} \quad -3 \quad -\sqrt{15} \quad -2 \quad -\sqrt{11} \quad -8$$

Problem 6:

The Wizard from Poppy Land has dwarfs and dragons. These creatures have 50 heads and 140 legs. How many dwarfs and how many dragons does the Wizard have?

Problem 7:

Which is greater?

1. $1/3$ or 0.343343334
2. -5.3 or -5.4
3. $-2.73\bar{2}$ or $-2.732\bar{1}$
4. $1.7\bar{6}$ or $1.76\bar{1}$

Problem 8:

Name an irrational number

- a) greater than $4.1\bar{2}$
- b) less than $1.2\bar{3}$
- c) greater than $7.1\bar{2}$ but less than $7.1\bar{3}$
- d) between $-3.\bar{3}$ and $-3.\bar{2}$
- e) between 3.14159 and 3.14160
- f) between $2.13\bar{42}$ and $2.13\bar{41}$
- g) between $0.23123112311123. . . .$ and $0.231212312112. . . .$

Problem 9:

	<u>Number of Table Napkins</u>	<u>Thickness</u>
1st Time	1	.003 in.
2nd Time	2	.006 in.
3rd Time	4	.012 in.
4th Time	8	?

Continue this table by doubling the number of table napkins each time and calculating the total thickness. Continue the table up to 32 times. BUT FIRST MAKE A GUESS AS TO HOW HIGH THE PILE OF NAPKINS WILL BE. Do you think it will be 1 foot high? As high as your room from the floor to the ceiling? As high as the Husky Tower? As high as
 ? ? ? .*

Problem 10:

In a barn there are some hens and pigs. There are altogether 13 heads and 36 legs. How many hens and how many pigs are there in the barn?

* Modified after L. R. Lieber, and H. G. Lieber, The Education of T. C. Mits (New York, N.Y.: W. W. Nanton and Co., Inc., 1944).

Problem 11:

Irving ran up a gas bill of \$8.46 on his Bloopo Credit Card, the number of gallons used was 18. How much did Irving pay per gallon of gas?

If Irving averaged 51.7 miles per gallon, how many miles did he put on his scooter?

Problem 12:

The first stage rocket of Venus 14 carries 19,000 lbs. of solid fuel. If it uses this fuel at a rate of 2,000 lbs. per minute, how long will the first stage fire before it burns out?

Problem 13:

While watching a woodchopper, Sam hears the axe strike the tree $1 \frac{2}{5}$ seconds after he sees it strike the tree. How far is Sam from the woodchopper?*

Problem 14:

In Sunalta Junior High School there are 210 girls. There are twice as many blue-eyed girls as green-eyed girls and there are 10 more brown-eyed girls than blue-eyed girls. How many blue-, green-, and brown-eyed girls are there?

* Modified after D. G. Seymour, and R. Gidley, EUREKA (Palo Alto, Calif.: Creative Publications, 1968), p. 110.

Problem 15:

A mattress is 4 feet 6 inches wide and 6 inches deep. How much of a 90-inch wide sheet is available on each side of the bed for tucking under the mattress?*

Problem 16:

Using a measuring tape, find out how long it would take you to walk 55 yards.

Using this figure, find out how long it would take you to walk a mile; 25 miles; The Miles for Millions March.

* Modified after F. Land, The Language of Mathematics (London, Ont.: John Murray Publishers Ltd., 1960).

Problem 17:

Lorne built a fence around his 19 girl friends. The enclosed region was square shaped and he used 27 fence poles on each side of the square. How many poles did he use altogether?

Problem 18:

If you had \$5 billion and you gave away a \$500 bill every minute, how long would it take you to give away all your money?*

* Modified after D. G. Seymour, and R. Gidley, EUREKA (Palo Alto, Calif.: Creative Publications, 1968), p. 121.

Problem 19:

The express bus averages 56 m.p.h. on a trip to Edmonton.

The express train averages 64 m.p.h. on a trip to Edmonton. How much time do you save by taking the train from Calgary to Edmonton?

Problem 20:

Richard wants to buy a new Super Dooper Scooper Motor Bike for \$750. One dealer offered him \$150 for his old bike as a trade-in. Another dealer offered him a 6 1/2% cash discount off the purchase price but no trade-in. Richard could sell his bike privately for \$100.

Which dealer is giving him the best offer?

How much does he save by going to this dealer?

Problem 21:

THE PHEASANT COOP

Herbie caught a young pheasant with an injured wing. He decided to keep it in his back yard. He had 50 feet of wire fence, and wanted to make a pen with the largest area possible. Work out the length and width which will enclose the largest space.

Problem 22:

The area manager for a local ski hill says 3.5 inches of fresh powder snow are needed for every inch of packed base. If a ski hill has a base of 5 feet 3 inches, how much fresh snow has fallen?

Problem 23:

Apollo astronaut Armstrong walked 885 yards in 177 steps. What were the average size of his "small steps" or were they "giant steps"?

Problem 24:

I see two numbers. If you add them together you get 29. If you subtract the second number from the first you get 3. What two numbers do I see?

Problem 25:

How fast can you run 100 yards?

Could you break the 4-minute mile if you could maintain your top speed?*

Problem 26:

Vancouver's population is greater than Calgary's by more than 860,000. What is Vancouver's population?

* Modified after R. A. J. Pethen, The Workshop Approach to Mathematics (Toronto, Ont.: The Macmillan Co. of Canada Ltd., 1968), Complete Set: Cards 1-224.

Problem 27:

Find the area of one of your feet to the nearest square inch.

Find your weight.

Calculate the weight per square inch of foot when you are standing on two feet and one foot.

Problem 28:

Write these mathematical sentences in words by making up a problem or a story:

$$n + 183 = 490$$

$$47 + X < 78$$

$$s \pm 24 \frac{1}{2} > 50 \quad \wedge \quad s < 31$$

Problem 29:

If Dianne were 3 years older, she would be twice as old as Susan.
If Dianne were two years younger, she and Susan would be the same age.
How old is each girl?

Problem 30:

See if you can find a condition to express the relationship between the height of bounce of a ball and the height of the drop.

(Hint: make a table of values and graph the results.)

Problem 31:

Make up a problem that involves the number indicated:

- a) your age
- b) the total number in your family
- c) your weight

Problem 32:

Suppose we send you to the planet Pluto in 1980 in a space ship that travels 85,000 m.p.h. How long will it take you to get there?

Problem 33:

Before Christmas, every girl in Mrs. Makway's class had 3 wigs, except for Heather, who had 5 wigs (one was orange). On Christmas Day one half of the girls received a new wig. As a result the class had 16 per cent more wigs than they had before. How many girls are there in Mrs. Makway's class?

Problem 34:

Allan had a dream about girls and sports cars. When all the girls in Allan's dream got into sports cars, there was one girl per car, and five cars were empty. Then one half of the girls got into a space ship and blasted off for Jupiter. After that, whenever all of the remaining girls got into the sports cars, there was one girl per car, but 23 cars were empty. How many girls were there in Allan's dream?*

* Modified after Robert B. Davis, Discovery in Mathematics, A Text for Teachers (Reading, Mass.: Addison Wesley Publishing Co., 1964).

Problem 35:

The Apollo space capsule is travelling at a speed of 1,000 m.p.h. The lunar module is trying to catch up to the space capsule at a speed of 1,200 m.p.h. If they are 2,300 miles apart, how long will it be before they meet? How many miles will the lunar module travel before it catches the space capsule?

Problem 36:

WOOD SCREWS*

The sizes of wood screws are indicated by numbers. The size of a screw indicates the diameter of its shank. Examine the table below.

Diameter of shank of screw in thousandths of an inch (y)	66	80	94	108	122	136	150	164	178	192	206
Standard size of screw (x)	1	2	3	4	5	6	7	8	9	10	11

Plot these numbers on a graph and find the algebraic condition for the line which passes through these points.

* Modified after F. Land, The Language of Mathematics (London, Ont.: John Murray Publishers Ltd., 1960), p. 113.

Problem 37:

Last winter, the F. E. Osborne Junior High School Ski Club went skiing on four Saturdays. On the first three Saturdays, two-thirds of those who went skiing each weekend were injured. Each member skied every Saturday until he or she was injured. After the injury the member did not ski again.

The Club bought 100 day tickets for the ski tow at the beginning of the season. Each ticket was good for one member for one Saturday. After the fourth weekend, the Club had 20 tickets left. The Club voted unanimously to sell these tickets to the Colonel Irvine Ski Club and rename theirs the F. E. Osborne Curling Club.

How many members of the F. E. Osborne Ski Club went skiing on the first weekend?*

Problem 38:

Find out how far your family's car will travel on a gallon of gasoline on the highway. How many gallons of gasoline (to nearest tenth of a gallon) will be needed to travel to Edmonton and back; Vancouver and back? How much will the return journey from Vancouver cost at 49.9¢ per gallon of gasoline?

* Modified after Robert B. Davis, Discovery in Mathematics, A Text for Teachers (Reading, Mass.: Addison Wesley Publishing Co., 1964), p. 240.

Problem 39:

The sum of two numbers is 20. If one number is doubled and the other is multiplied by 4, the sum of the two new numbers is 66. What are the two numbers?

Make up a similar problem.

Problem 40:

How would you convince your friend that if there are 367 boys and girls in the auditorium, then at least two of them must have the same birthday?*

* Modified after E. D. Nichols et al., Elementary Mathematics 7, Patterns and Structure, Teacher's Edition (New York, N.Y.: Holt, Rinehart and Winston, Inc., 1966).

Problem 41:

Calculate your weight in pennies.

Problem 42:

A new Jumbo Jet flies over your school at a speed of 575 m.p.h. at 8:30 a.m., on a trip to Bermuda. If it maintains this speed, about what time should it be over Bermuda?

Problem 43:

Kathleen bought a 6-foot roll of stamps for \$6.00. If one stamp measures $\frac{5}{8}$ inches, how many stamps did she get in the roll?

Problem 44:

Lorne and Doug climbed Mt. Assiniboine in the summer. Mt. Assiniboine has an altitude of 12,093 feet above sea level. The difference in altitude between the top of Mt. Assiniboine and their base camp at Wonder Pass was 6,117 feet. What was the elevation of their camp?

Problem 45:

How far can you travel in $1/4$ minute:

walking?

running?

How far in an hour?

Could you run a 4-minute mile if you could maintain your top speed?*

Problem 46:

The sonic boom from some jets flying over Kelowna last summer took 5.5 seconds to reach town and crack a number of store windows.

How far above town were the jets?

* Modified after R. A. J. Pethen, The Workshop Approach to Mathematics (Toronto, Ont.: The Macmillan Co. of Canada Ltd., 1968), Complete Set: Cards 1-224.

Problem 47:

Miss Moog handed out three sheets of graph paper and had 31 sheets left. She then handed out 1 more sheet to each student and had 8 sheets left. How many sheets of graph paper did Miss Moog have to begin with and how many students are there in the class?

Problem 48:

The number of bacteria enclosed in a bottle doubles each minute. If the bottle is filled completely with bacteria after 30 minutes, how long ago was the bottle half full?*

* Modified after E. D. Nichols et al., Elementary Mathematics 7, Patterns and Structure, Teacher's Edition (New York, N.Y.: Holt, Rinehart and Winston, Inc., 1966).

Problem 49:

My age this year is a multiple of 7 and next year it will be a multiple of 5. If I am not yet 50 and over 30, can you say how old I am?

Problem 50:

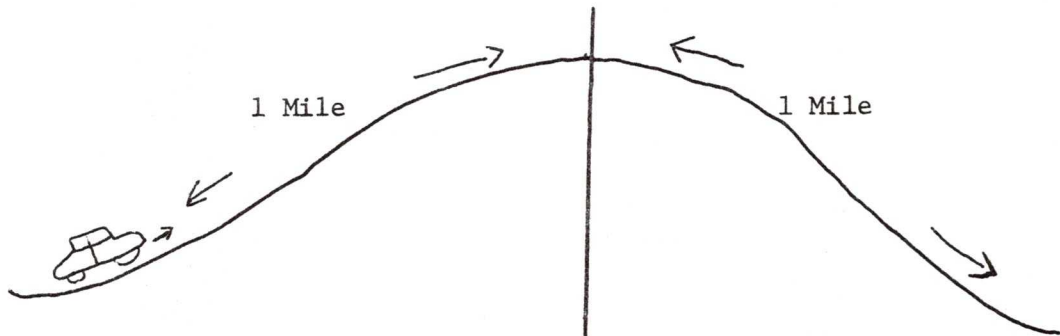
Make up your own problem. See if one of your classmates can solve your problem.

Problem 51:

Jill and Jenny start out on a hike near Moraine Lake at 1:00 p.m. and return at 7:00 p.m. If their speed is 4 m.p.h. on level land, 3 m.p.h. uphill and 6 m.p.h. downhill, how far did they walk?

Problem 52:

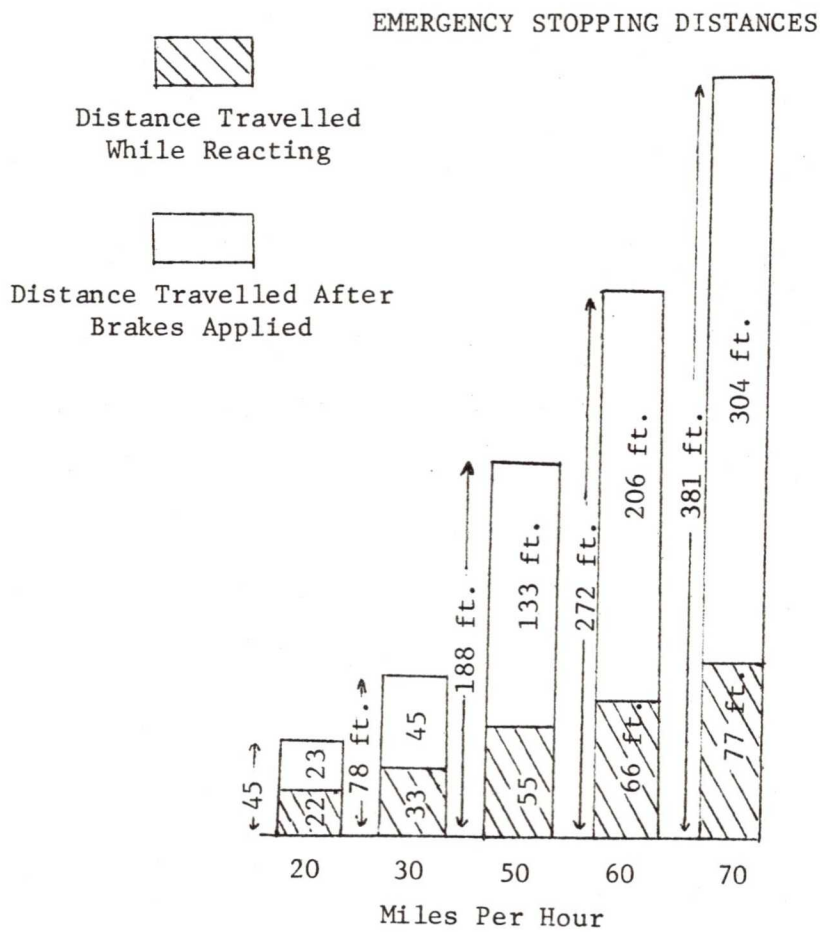
A car travels 1 mile uphill at 30 m.p.h. How fast should it travel 1 mile downhill in order to have an average speed of 60 m.p.h. over the entire 2 mile stretch?



Problem 53:

Each Boston player received \$9,000 as a member of the Stanley Cup team. Assuming each player played an average of 25 minutes in each game of a total of 14 games, how much did each player earn per minute of playing time?

Problem 54:



Can you figure out the equation they used?

Using these figures calculate a driver's reaction distance while travelling at the world record land speed.*

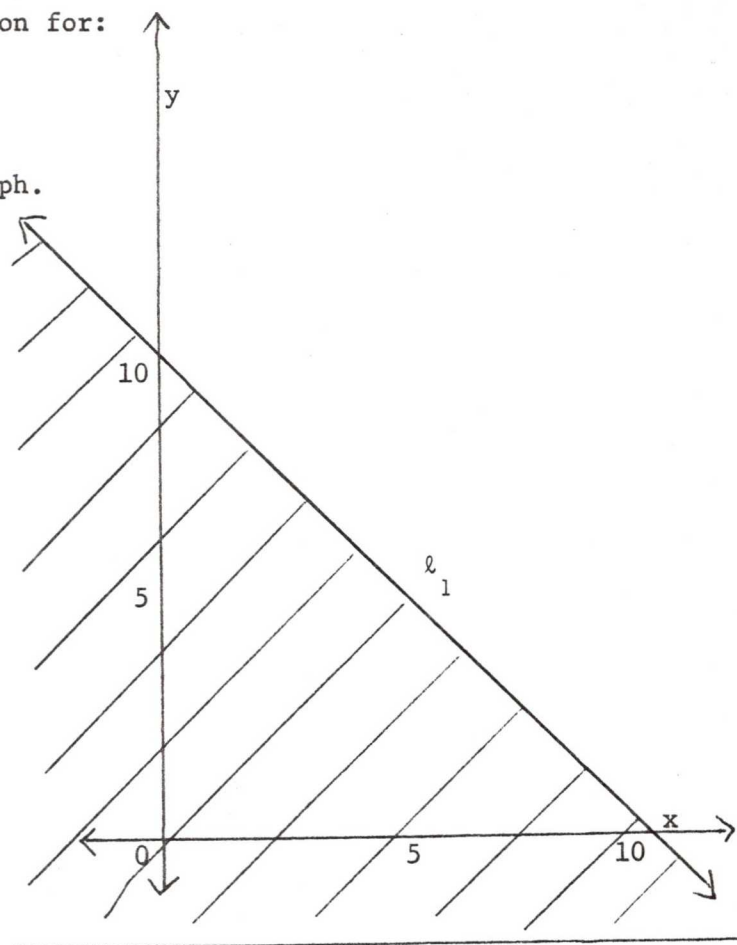
*Department of Highways and Transport, Alberta Operators' Manual (Edmonton, Alta.: L.S. Wall, Queen's Printer, 1969), p. 46.

Problem 55:

See if you can write a condition for:

a) l_1

b) the shaded part of the graph.



Problem 56:

Joe Bananas bought a ball and a bat for his son, Lurch. The bat and ball together cost \$3.75. The ball cost \$.75 more than the bat. What was the cost of each?*

Problem 57:

A number is 2 more than a second number and is also 6 less than twice the second number. What's the number?

* Modified after D. G. Seymour, and R. Gidley, EUREKA (Palo Alto, Calif.: Creative Publications, 1968), p. 114.